

## APPENDIX N. NATIONAL ENERGY SAVINGS (NES)

### TABLE OF CONTENTS

APPENDIX N: INTRODUCTION .....	N-1
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### LIST OF TABLES

Table N.1	Trial Standard Level 1, MEF=1.021 (20% Reduction in Energy Use) .....	N-2
Table N.2	Trial Standard Level 1, MEF=1.021 .....	N-2
Table N.3	Trial Standard Level 2, MEF=1.089 (25% Reduction in Energy Use) .....	N-3
Table N.4	Trial Standard Level 2, MEF=1.089 .....	N-3
Table N.5	Trial Standard Level 4, MEF=1.257 (35% Reduction in Energy Use) .....	N-4
Table N.6	Trial Standard Level 4, MEF=1.257 .....	N-4
Table N.7	Trial Standard Level 5, MEF=1.362 (40% Reduction in Energy Use) .....	N-5
Table N.8	Trial Standard Level 5, MEF=1.362 .....	N-5
Table N.9	Trial Standard Level 6, MEF=1.634 (50% Reduction in Energy Use) .....	N-6
Table N.10	Trial Standard Level 6, MEF=1.634 .....	N-6
Table N.11	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-7
Table N.12	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-7
Table N.13	Trial Standard Level 1, MEF=1.021 (20%, Medium Price/Income Elasticity) .....	N-9
Table N.14	Trial Standard Level 1, MEF=1.021 .....	N-9
Table N.15	Trial Standard Level 2, MEF=1.089 (25%, Medium Price/Income Elasticity) .....	N-10
Table N.16	Trial Standard Level 2, MEF=1.089 .....	N-10
Table N.17	Trial Standard Level 4, MEF=1.257 (35%, Medium Price/Income Elasticity) .....	N-11
Table N.18	Trial Standard Level 4, MEF=1.257 .....	N-11
Table N.19	Trial Standard Level 5, MEF=1.362 (40%, Medium Price/Income Elasticity) .....	N-12
Table N.20	Trial Standard Level 5, MEF=1.362 .....	N-12
Table N.21	Trial Standard Level 6, MEF=1.634 (50%, Medium Price/Income Elasticity) .....	N-13
Table N.22	Trial Standard Level 6, MEF=1.634 .....	N-13
Table N.23	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-14
Table N.24	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-14
Table N.25	Trial Standard Level 1, MEF=1.021 (20%, High Price Elasticity) .....	N-15
Table N.26	Trial Standard Level 1, MEF=1.021 .....	N-15
Table N.27	Trial Standard Level 2, MEF=1.089 (25%, High Price Elasticity) .....	N-16
Table N.28	Trial Standard Level 2, MEF=1.089 .....	N-16
Table N.29	Trial Standard Level 4, MEF=1.257 (35%, High Price Elasticity) .....	N-17
Table N.30	Trial Standard Level 4, MEF=1.257 .....	N-17
Table N.31	Trial Standard Level 5, MEF=1.362 (40%, High Price Elasticity) .....	N-18
Table N.32	Trial Standard Level 5, MEF=1.362 .....	N-18
Table N.33	Trial Standard Level 6, MEF=1.634 (50%, High Price Elasticity) .....	N-19

Table N.34	Trial Standard Level 6, MEF=1.634 .....	N-19
Table N.35	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-20
Table N.36	Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007 .....	N-20

## LIST OF FIGURES

Figure N.1	Trial Standard Level 1, MEF= 1.021 .....	N-2
Figure N.2	Trial Standard Level 2, MEF=1.089 .....	N-3
Figure N.3	Trial Standard Level 4, MEF=1.257 .....	N-4
Figure N.4	Trial Standard Level 5, MEF = 1.362 .....	N-5
Figure N.5	Trial Standard Level 6, MEF = 1.634 .....	N-6
Figure N.6	Trial Standard Level 3, MEF = 1.04/1.26 .....	N-7
Figure N.7	Trial Standard Level 1, MEF= 1.021 .....	N-8
Figure N.8	Trial Standard Level 2, MEF= 1.089 .....	N-9
Figure N.9	Trial Standard Level 4, MEF= 1.257 .....	N-10
Figure N.10	Trial Standard Level 5, MEF= 1.362 .....	N-11
Figure N.11	Trial Standard Level 6, MEF= 1.634 .....	N-12
Figure N.12	Trial Standard Level 3, MEF= 1.04/1.26 in 2004/2007 .....	N-13
Figure N.13	Trial Standard Level 1, MEF= 1.021 .....	N-14
Figure N.14	Trial Standard Level 1, MEF= 1.021 .....	N-15
Figure N.15	Trial Standard Level 4, MEF= 1.257 .....	N-16
Figure N.16	Trial Standard Level 5, MEF= 1.362 .....	N-17
Figure N.17	Trial Standard Level 6, MEF= 1.634 .....	N-18
Figure N.18	Trial Standard Level 3, MEF= 1.04/1.26 in 2004/2007 .....	N-19

## **APPENDIX N. NATIONAL ENERGY SAVINGS (NES) SPREADSHEET OUTPUT**

### **N.1 INTRODUCTION**

The NES spreadsheet (NES2k0515-2T.xls) calculates the energy and water savings by comparing the energy and water consumption associated with clothes washers in a base case with that in a specified standards case. This spreadsheet uses data from RECS93 and AEO99. The following pages contain tables and figures showing the results for each of the trial standards cases assessed in this analysis. For each standards case two tables are presented. The first shows cumulative energy savings by fuel type (electricity, gas, oil and LPG) and water savings for years 2010, 2020 and 2030. The second shows net present values (including energy and water savings and equipment cost) from 2003 to 2030 discounted at 7% real to 1999. Benefit and cost ratios are also presented. The corresponding figure for each standard case shows the annual benefit/cost pattern of national savings and costs resulting from standards over time. The heavy line running just below the energy and water savings bars indicates the undiscounted net national consumer impact of standards over time. It is important to note that the net saving shown in each plot only captures a snapshot of each year. For example, the benefit of the energy and water savings from the equipment expenditure in year 2005 actually continues through the lifetime of the clothes washers bought in 2005.

The results can be separated into three categories.

- |  |                    |
|--|--------------------|
| 1. Reference Case                      | Tables N.1 - N.12  |
| 2. Medium Price/Income Elasticity Case | Tables N.13 - N.24 |
| 3. High Price Elasticity Case          | Tables N.25 - N.36 |

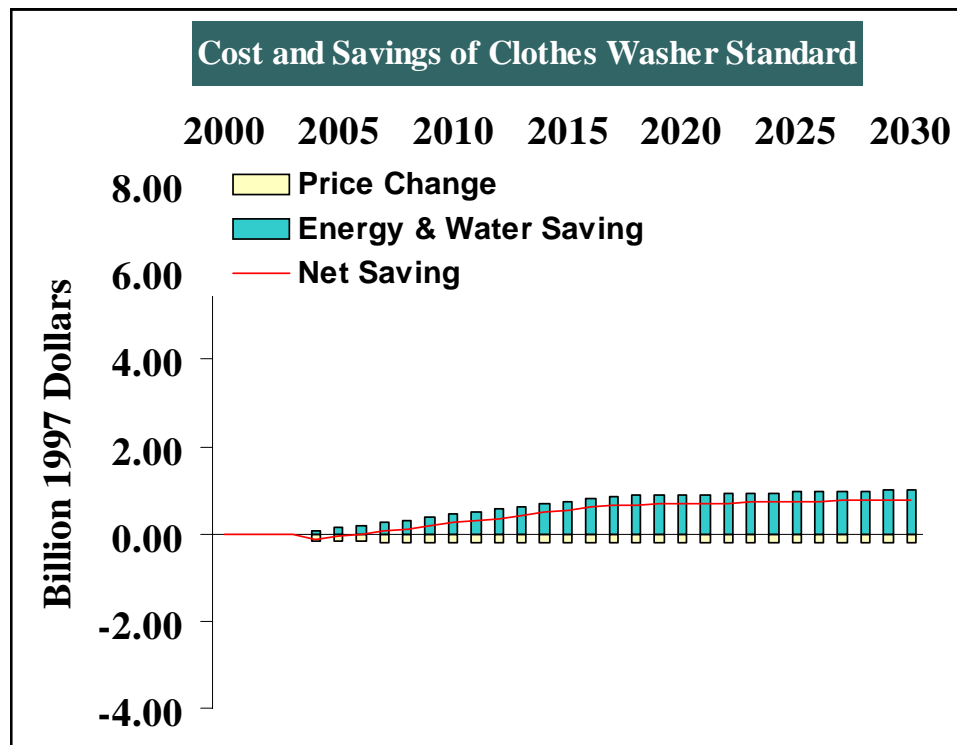
These parameters are discussed in Chapter 10. Detailed results for all three cases are presented here in Appendix N. The Medium Price/ Income Elasticity represents the scenario for which the drop in shipments after standards is the smallest. The high price elasticity represents a scenario for which there is the greatest drop in shipments. The Reference Case represents a medium price elasticity and gives a drop in shipments after standards greater than the Medium Price/ Income case and less than the High Price Elasticity case.

**Table N.1 Trial Standard Level 1, MEF=1.021 (20% Reduction in Energy Use)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	( <i>tril. gals.</i> )
from 2004						
to 2010	6.22	6.12	0.09	0.01	0.00	0.05
to 2020	1.07	0.57	0.45	0.03	0.02	0.26
To 2030	2.12	1.10	0.91	0.06	0.05	0.53

**Table N.2 Trial Standard Level 1, MEF=1.021**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	5.48
Net Equipment Cost	1.82
Net Present Benefit	3.66
Benefit/Cost Ratio	3.0

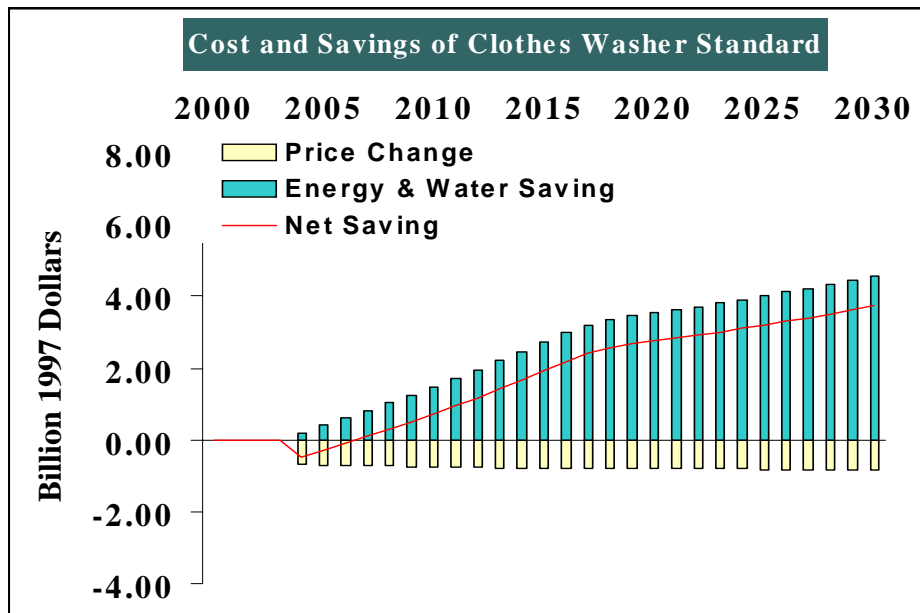
**Figure N.1 Trial Standard Level 1, MEF= 1.021**

**Table N.3 Trial Standard Level 2, MEF=1.089 ((25% Reduction in Energy Use)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.41	0.23	0.16	0.01	0.01	0.84
to 2020	2.03	1.08	0.86	0.06	0.04	4.48
To 2030	4.04	2.10	1.74	0.11	0.08	9.09

**Table N.4 Trial Standard Level 2, MEF=1.089**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	21.24
Net Equipment Cost	6.95
Net Present Benefit	14.29
Benefit/Cost Ratio	3.1

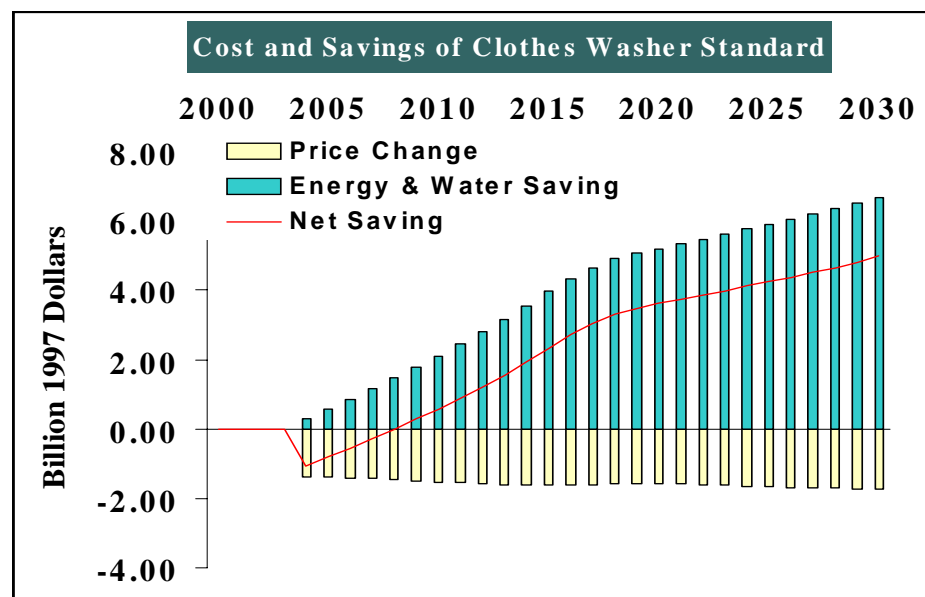
**Figure N.2 Trial Standard Level 2, MEF=1.089**

**Table N.5 Trial Standard Level 4, MEF=1.257 (35% Reduction in Energy Use)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.60	0.38	0.20	0.01	0.01	1.16
to 2020	2.98	1.79	1.06	0.07	0.05	6.30
To 2030	5.99	3.55	2.19	0.14	0.11	12.94

**Table N.6 Trial Standard Level 4, MEF=1.257**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	30.90
Net Equipment Cost	14.03
Net Present Benefit	16.88
Benefit/Cost Ratio	2.2



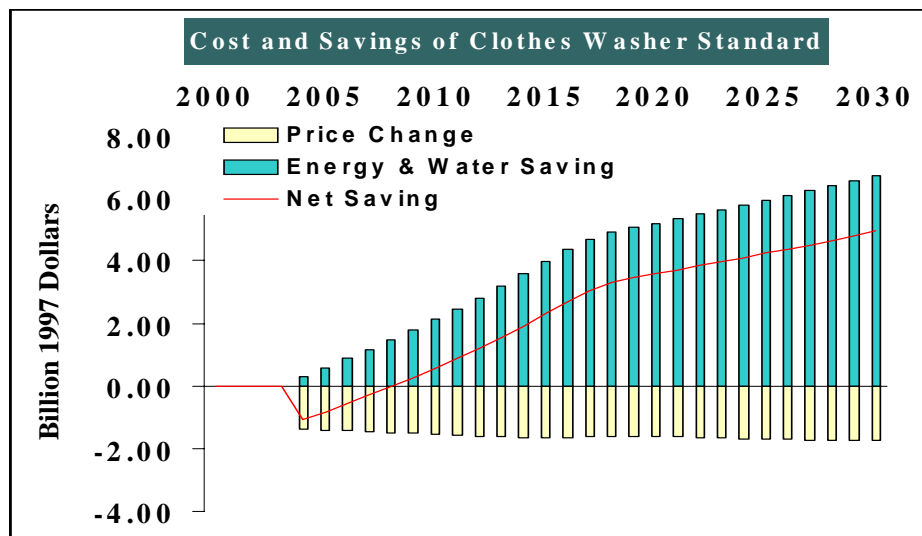
**Figure N.3 Trial Standard Level 4, MEF=1.257**

**Table N.7 Trial Standard Level 5, MEF=1.362 (40% Reduction in Energy Use)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.60	0.39	0.20	0.01	0.01	1.16
to 2020	3.00	1.81	1.07	0.07	0.05	6.29
To 2030	6.03	3.58	2.19	0.14	0.11	12.94

**Table N.8 Trial Standard Level 5, MEF=1.362**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	30.98
Net Equipment Cost	14.25
Net Present Benefit	16.73
Benefit/Cost Ratio	2.2



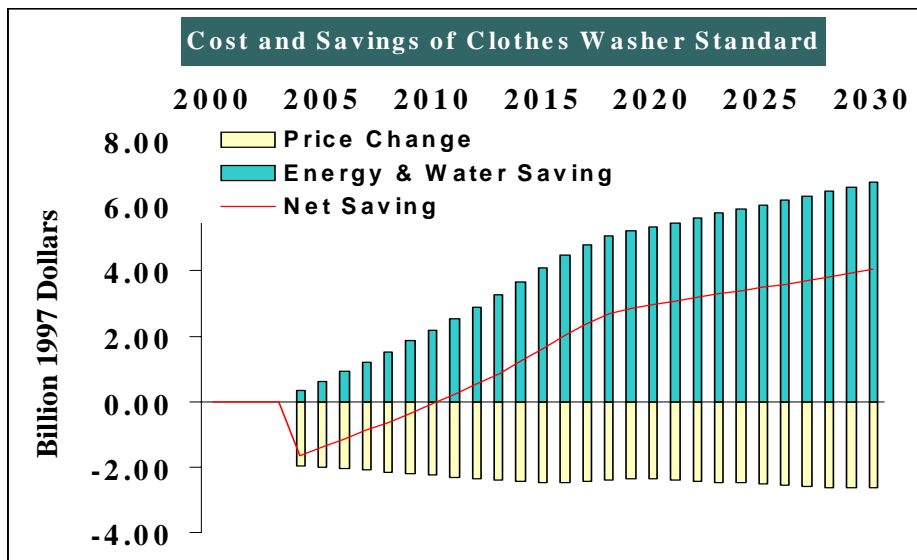
**Figure N.4 Trial Standard Level 5, MEF = 1.362**

**Table N.9 Trial Standard Level 6, MEF=1.634 (50% Reduction in Energy Use)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.73	0.50	0.21	0.01	0.01	0.95
to 2020	3.69	2.41	1.16	0.07	0.05	5.24
To 2030	7.53	4.85	2.42	0.15	0.11	10.85

**Table N.10 Trial Standard Level 6, MEF=1.634**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	31.69
Net Equipment Cost	20.90
Net Present Benefit	10.79
Benefit/Cost Ratio	1.5

**Figure N.5 Trial Standard Level 6, MEF = 1.634**

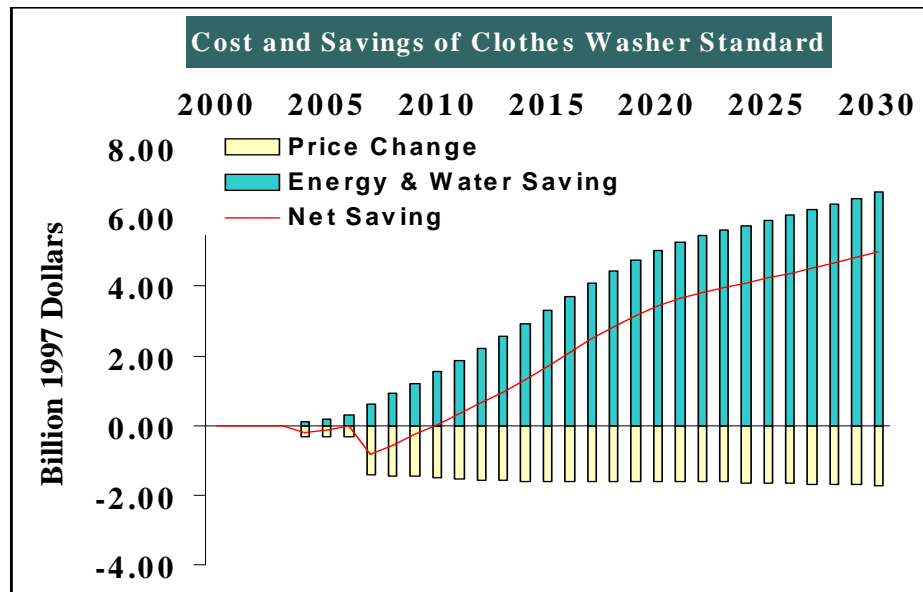


**Table N.11 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.39	0.23	0.14	0.01	0.01	0.60
to 2020	2.51	1.47	0.93	0.06	0.05	4.97
To 2030	5.52	3.23	2.05	0.14	0.10	11.59

**Table N.12 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	27.16
Net Equipment Cost	11.86
Net Present Benefit	15.30
Benefit/Cost Ratio	2.3



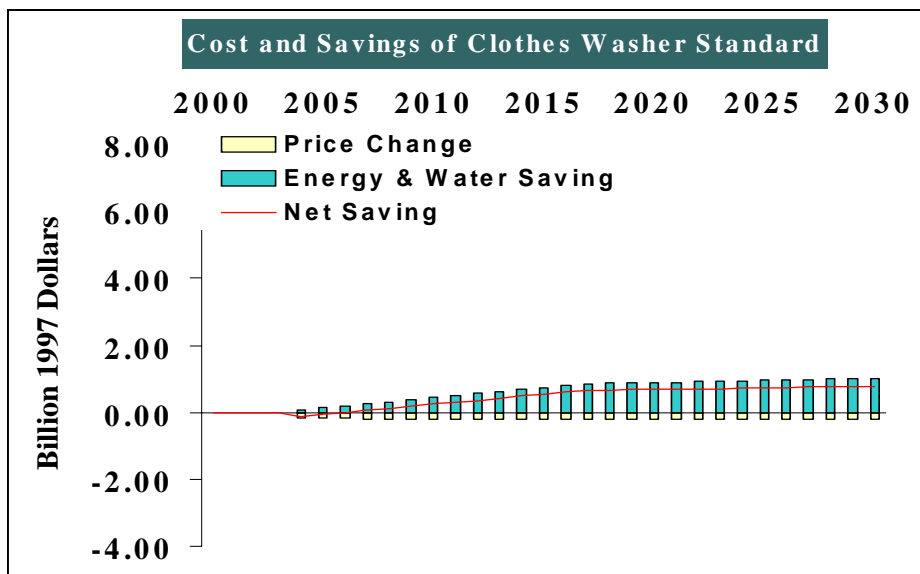
**Figure N.6 Trial Standard Level 3, MEF = 1.04/1.26**

**Table N.13 Trial Standard Level 1, MEF=1.021 (20%, Medium Price/Income Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.22	0.13	0.09	0.01	0.00	0.05
to 2020	1.08	0.57	0.45	0.03	0.02	0.27
To 2030	2.13	1.11	0.92	0.06	0.05	0.54

**Table N.14 Trial Standard Level 1, MEF=1.021**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	5.53
Net Equipment Cost	1.85
Net Present Benefit	3.68
Benefit/Cost Ratio	3.0

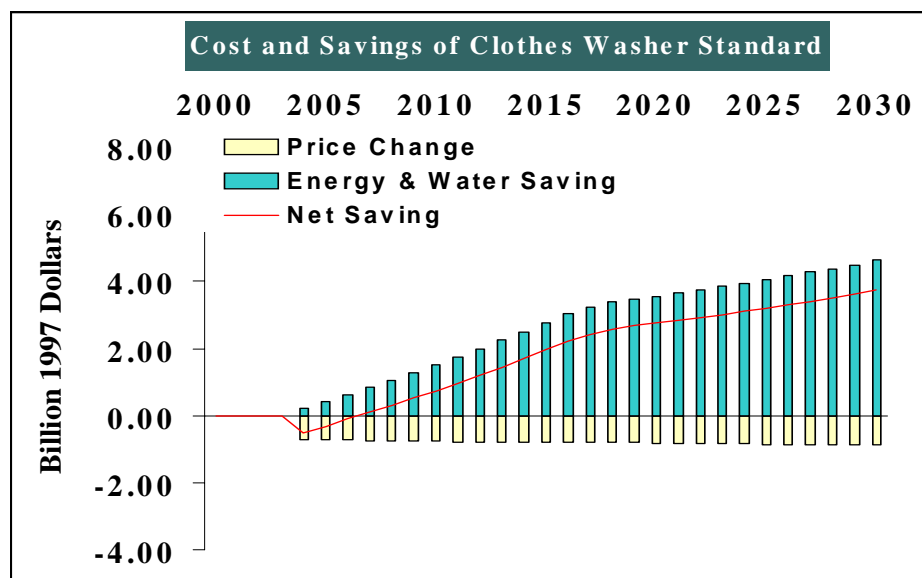
**Figure N.7 Trial Standard Level 1, MEF= 1.021**

**Table N.15 Trial Standard Level 2, MEF=1.089 (25%, Medium Price/Income Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.42	0.24	0.16	0.01	0.01	0.86
to 2020	2.06	1.09	0.87	0.06	0.04	4.54
To 2030	4.08	2.12	1.76	0.11	0.08	9.17

**Table N.16 Trial Standard Level 2, MEF=1.089**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	21.56
Net Equipment Cost	7.16
Net Present Benefit	14.40
Benefit/Cost Ratio	3.0



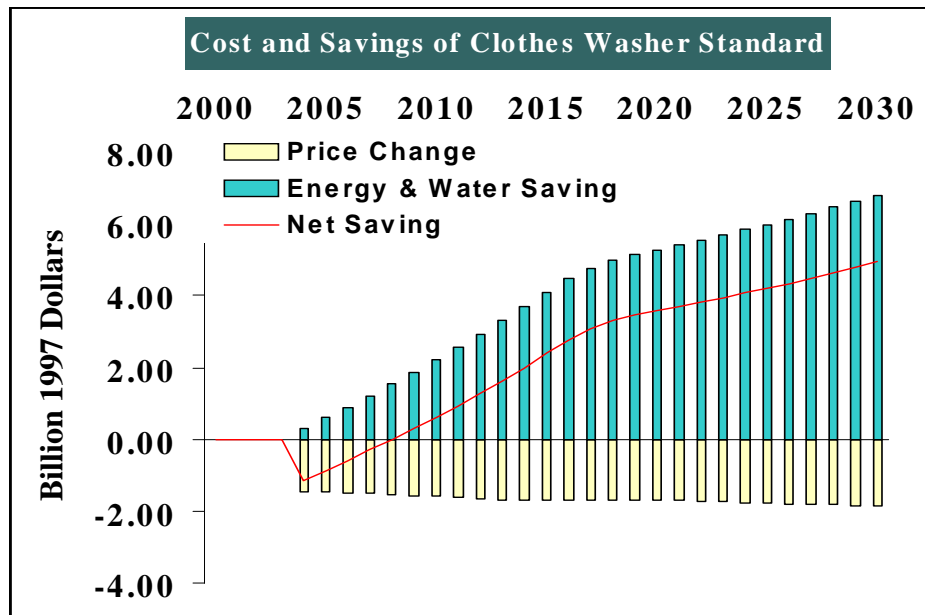
**Figure N.8 Trial Standard Level 2, MEF= 1.089**

**Table N.17 Trial Standard Level 4, MEF=1.257 (35%, Medium Price/Income Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.63	0.40	0.20	0.01	0.01	1.21
to 2020	3.06	1.84	1.09	0.07	0.05	6.47
To 2030	6.09	3.61	2.23	0.15	0.11	13.15

**Table N.18 Trial Standard Level 4, MEF=1.257**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	31.78
Net Equipment Cost	14.80
Net Present Benefit	16.98
Benefit/Cost Ratio	2.1



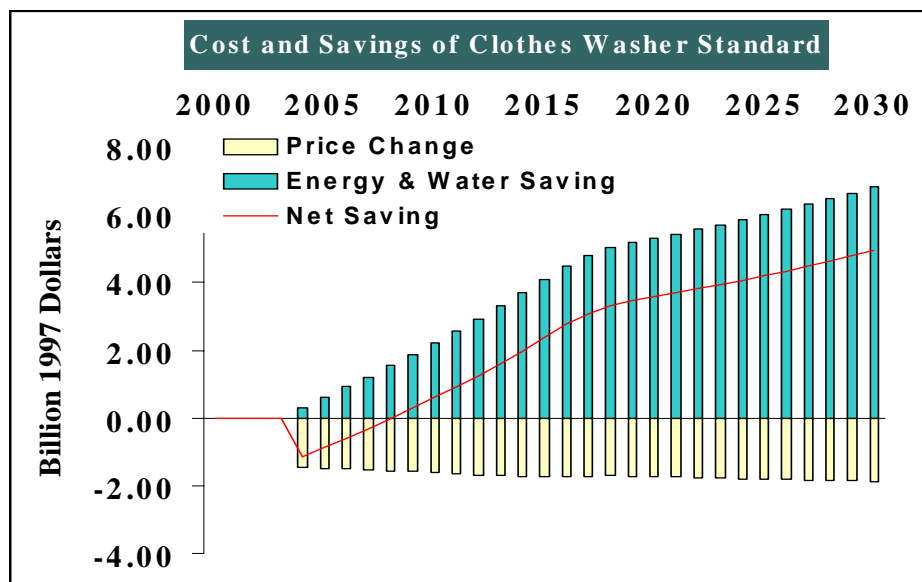
**Figure N.9 Trial Standard Level 4, MEF= 1.257**

**Table N.19 Trial Standard Level 5, MEF=1.362 (40%, Medium Price/Income Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.63	0.40	0.20	0.01	0.01	1.20
to 2020	3.08	1.86	1.10	0.07	0.05	6.47
To 2030	6.13	3.65	2.23	0.15	0.11	13.15

**Table N.20 Trial Standard Level 5, MEF=1.362**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	31.87
Net Equipment Cost	15.05
Net Present Benefit	16.83
Benefit/Cost Ratio	2.1



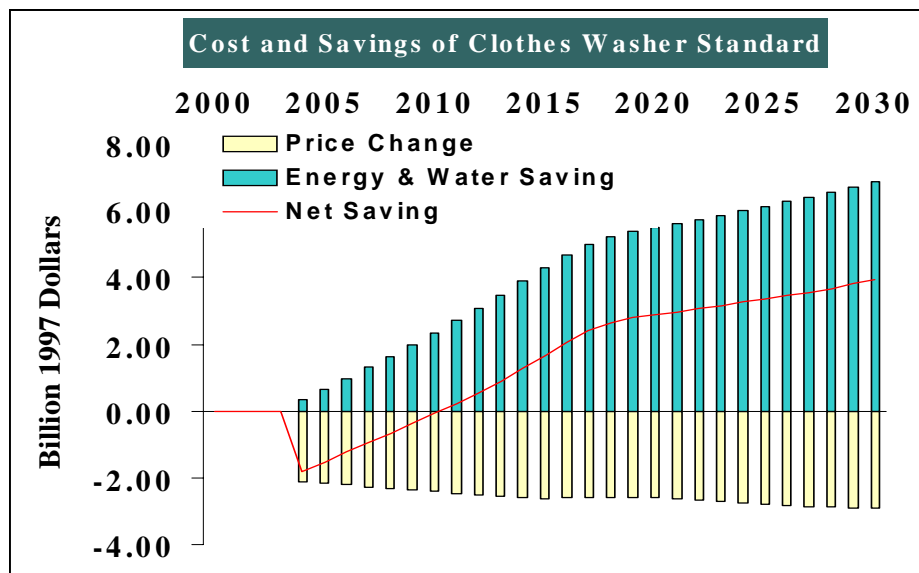
**Figure N.10 Trial Standard Level 5, MEF= 1.362**

**Table N.21 Trial Standard Level 6, MEF=1.634 (50%, Medium Price/Income Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.78	0.53	0.22	0.01	0.01	1.01
to 2020	3.84	2.50	1.20	0.07	0.06	5.45
To 2030	7.70	4.96	2.47	0.15	0.11	11.09

**Table N.22 Trial Standard Level 6, MEF=1.634**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	33.00
Net Equipment Cost	22.54
Net Present Benefit	10.46
Benefit/Cost Ratio	1.5



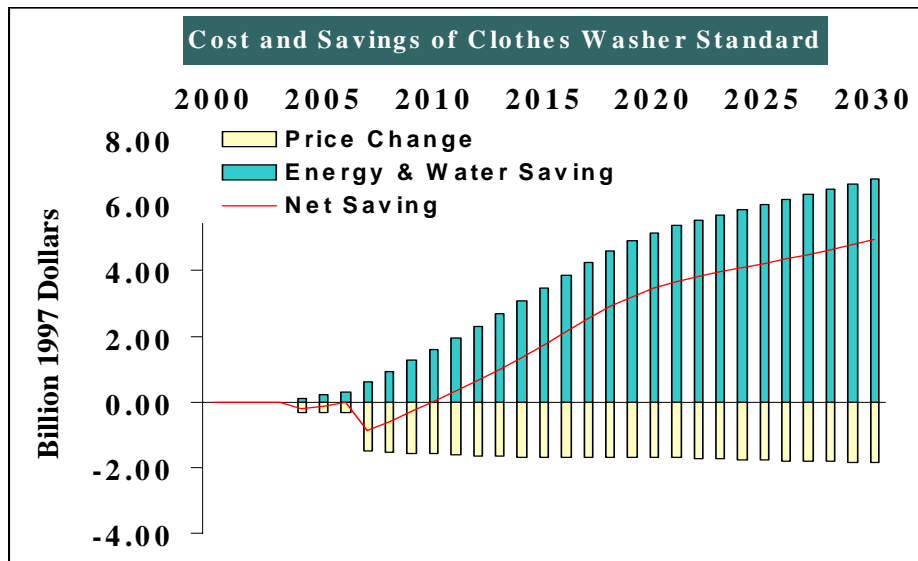
**Figure N.11 Trial Standard Level 6, MEF= 1.634**

**Table N.23 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.40	0.24	0.14	0.01	0.01	0.62
to 2020	2.58	1.52	0.95	0.067	0.05	5.12
To 2030	5.61	3.28	2.08	0.14	0.10	11.80

**Table N.24 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	27.94
Net Equipment Cost	12.52
Net Present Benefit	15.42
Benefit/Cost Ratio	2.2

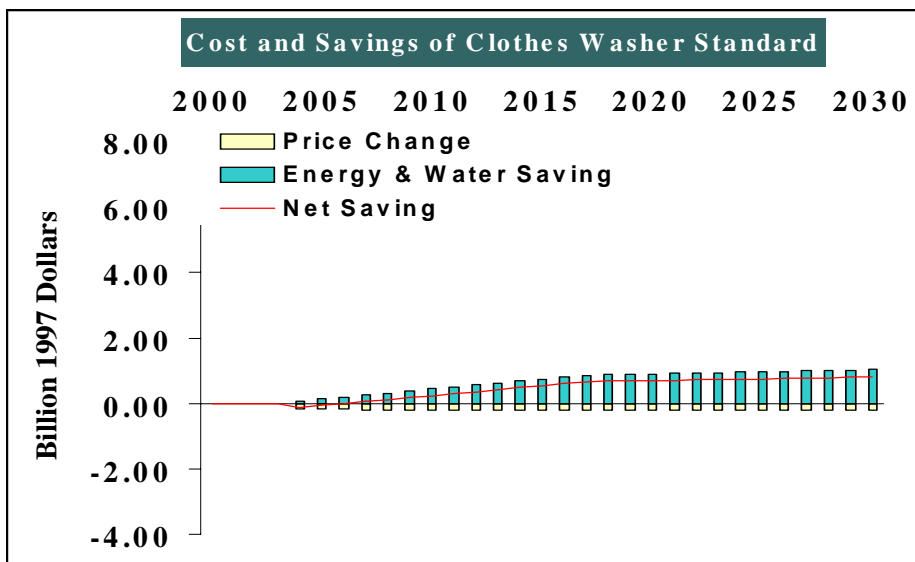
**Figure N.12 Trial Standard Level 3, MEF= 1.04/1.26 in 2004/2007**

**Table N.25 Trial Standard Level 1, MEF=1.021 (20%, High Price Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.22	0.12	0.09	0.01	0.00	0.05
to 2020	1.08	0.57	0.45	0.03	0.02	0.26
To 2030	2.15	1.11	0.92	0.06	0.05	0.54

**Table N.26 Trial Standard Level 1, MEF=1.021**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	5.52
Net Equipment Cost	1.82
Net Present Benefit	3.70
Benefit/Cost Ratio	3.0

**Figure N.13 Trial Standard Level 1, MEF= 1.021**

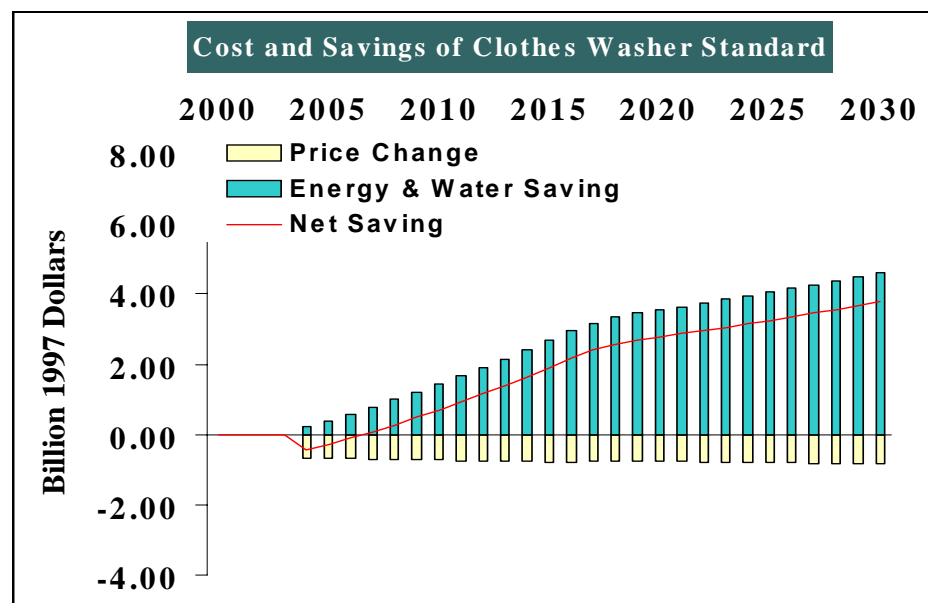


**Table N.27 Trial Standard Level 2, MEF=1.089 (25%, High Price Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.40	0.23	0.16	0.01	0.01	0.82
to 2020	2.01	1.06	0.85	0.06	0.04	4.45
To 2030	4.06	2.11	1.75	0.11	0.08	9.14

**Table N.28 Trial Standard Level 2, MEF=1.089**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	21.08
Net Equipment Cost	6.76
Net Present Benefit	14.32
Benefit/Cost Ratio	3.1



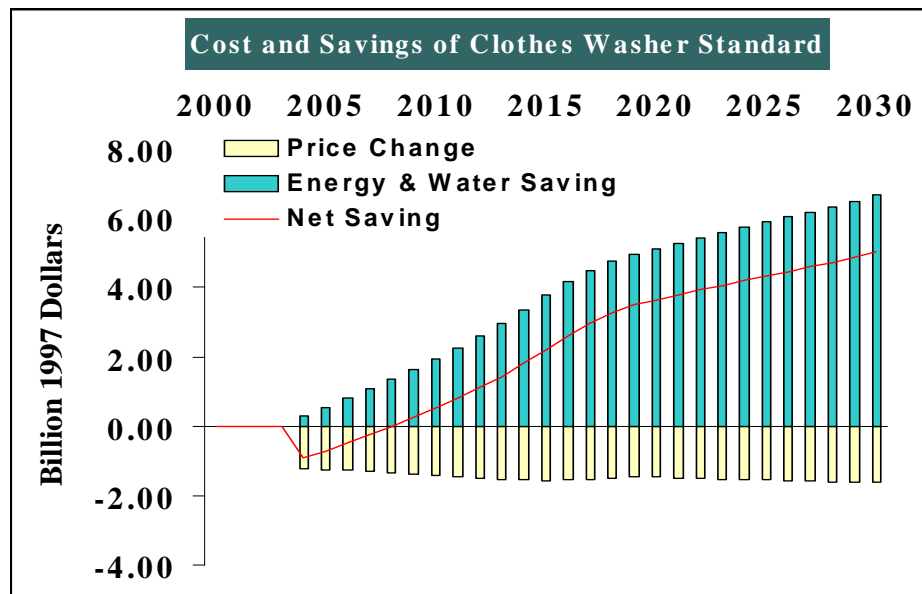
**Figure N.14 Trial Standard Level 1, MEF= 1.021**

**Table N.29 Trial Standard Level 4, MEF=1.257 (35%, High Price Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.56	0.36	0.18	0.01	0.01	1.08
to 2020	2.87	1.73	1.03	0.07	0.05	6.09
To 2030	5.94	3.52	2.17	0.14	0.11	12.86

**Table N.30 Trial Standard Level 4, MEF=1.257**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	29.86
Net Equipment Cost	13.06
Net Present Benefit	16.80
Benefit/Cost Ratio	2.3



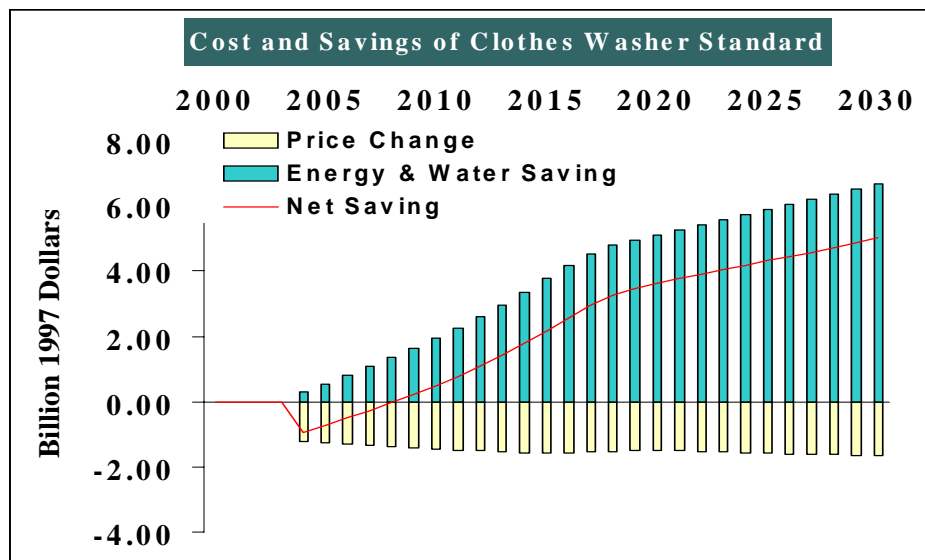
**Figure N.15 Trial Standard Level 4, MEF= 1.257**

**Table N.31 Trial Standard Level 5, MEF=1.362 (40%, High Price Elasticity)**

Energy and Water Savings						
	Total	Electric	Gas	Oil	LPG	Water Savings
from 2004						(tril. gals.)
to 2010						
to 2020						
To 2030						

**Table N.32 Trial Standard Level 5, MEF=1.362**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	29.91
Net Equipment Cost	13.25
Net Present Benefit	16.66
Benefit/Cost Ratio	2.3



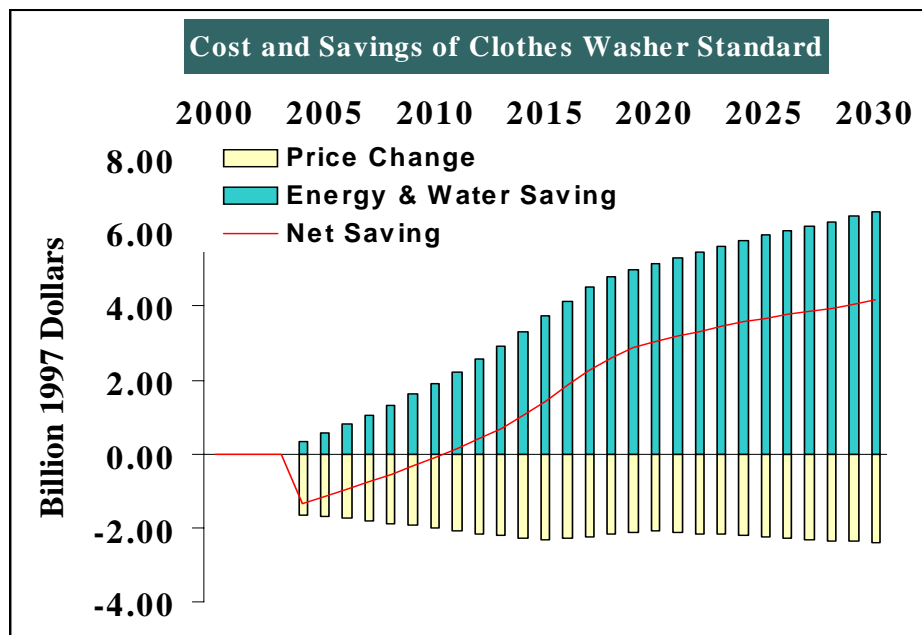
**Figure N.16 Trial Standard Level 5, MEF= 1.362**

**Table N.33 Trial Standard Level 6, MEF=1.634 (50%, High Price Elasticity)**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.65	0.45	0.18	0.01	0.01	0.85
to 2020	3.46	2.25	1.09	0.07	0.05	4.92
To 2030	7.36	4.74	2.37	0.15	0.11	10.63

**Table N.34 Trial Standard Level 6, MEF=1.634**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	29.71
Net Equipment Cost	18.53
Net Present Benefit	11.18
Benefit/Cost Ratio	1.6



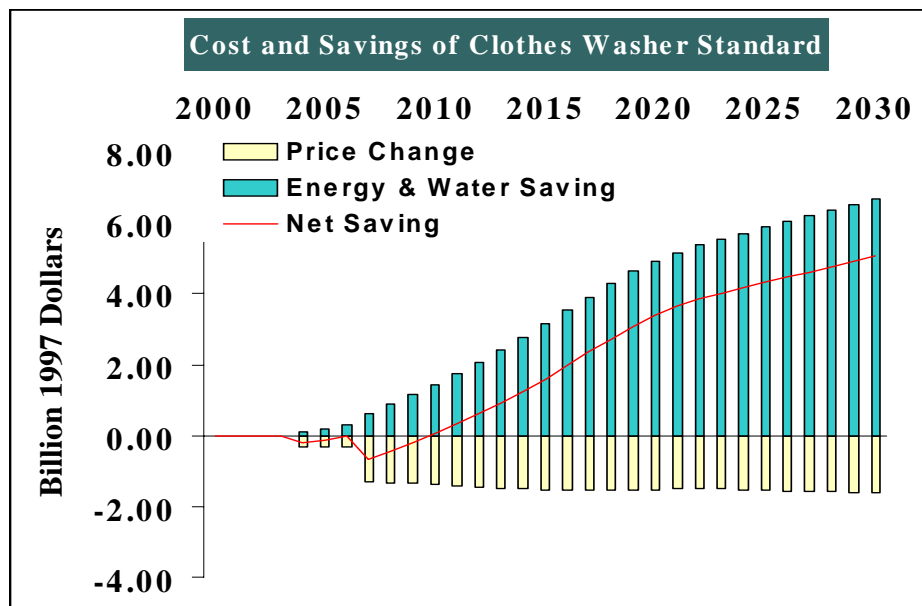
**Figure N.17 Trial Standard Level 6, MEF= 1.634**

**Table N.35 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Energy and Water Savings						
	Energy Savings in Quads					Water Savings
	Total	Electric	Gas	Oil	LPG	(tril. gals.)
from 2004						
to 2010	0.37	0.23	0.13	0.01	0.01	0.57
to 2020	2.43	1.43	0.90	0.06	0.04	4.79
To 2030	5.48	3.21	2.04	0.13	0.10	11.50

**Table N.36 Trial Standard Level 3, MEF=1.04/1.26 in 2004/2007**

Cost and Net Present Value (in billion 1997\$)	
Cumulative for Clothes Washers Purchased from 2004 to 2030	
Discounted at 7% to year 1999	
Total Energy and Water Savings	26.35
Net Equipment Cost	11.11
Net Present Benefit	15.25
Benefit/Cost Ratio	2.4



**Figure N.18 Trial Standard Level 3, MEF= 1.04/1.26 in 2004/2007**